



North America's Petrochemical  
Supply Chain Outlook 2021

# **A strategy for post-Covid-19** **The Imperative to Reconfigure the Supply Chain**

**Addressing resilience, sustainability,  
digital integration and optimal logistics**

February 2021

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## Introduction

**T**he window into North America's economy given by the petrochemical industry is showing a positive picture, even as companies experience both cyclical and structural shifts. The business of this critical sector, which accounts for a quarter of GDP in the US, is having to adapt its supply lines to the onslaught of the Covid-19 pandemic, while at the same time dealing with forces from both end-markets and its raw materials.

Marketplace challenges are intensifying with growing environmental regulation, the increasing preference of governments internationally for local production and disruption to major customers, namely the automotive and construction industries. A further headwind has come as the petrochemical industry has found itself caught up in international trade wars.

Pointing out that chemistry touches 96% of all manufactured goods, Ed Brzytwa, International Trade Director, American Chemistry Council (ACC), says: "It is more important than ever to grasp that global supply chains are mutually beneficial, interdependent webs across economies and industries."

As the industry stands at a crossroads, the drive to reconfigure these global supply chains is a major priority, as is assessing its capital requirements and devising new business models. New digital technologies such as IoT, artificial intelligence and blockchain will have a fundamental role to play in ensuring businesses remain competitive and afloat.



### Global supply chains are mutually beneficial, interdependent webs across economies and industries

**ED BRZYTWA**

International Trade Director, American Chemistry Council



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Chemistry touches  
**96%**  
of all  
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goods

Source: The American  
Chemistry Council

All the technical help that is available is needed to face the current challenge of container logjams at ports internationally as Covid-19 decimates supply-line workforces, causing freight rates to soar and threatening economic recovery. International commodity analyst, S&P Global Platts, suggests that the bottlenecks will take months to resolve. Notably the pandemic has highlighted the need for supply chains to become more local to minimize disruptions and improve sustainability.

Another management challenge is capex decisions – assessing how much to rein in over-production and balancing forecasts of supply and demand at a time when major export Asian markets are opting for self-sufficiency but economies are recovering.

In this white paper, experts from across the US outline challenges and opportunities for this vital, complex and diverse industry, which depends on resilient, adaptable and sustainable supply chains.



## Section 1

# Big Picture Lessons from 2020 – and Looking Ahead

For an industry that was already undergoing structural change and burdened by protectionist trade policies, the ‘black swan’ coronavirus event and the ensuing oil price crash made the picture bleaker than ever. Yet in the US, there is reason for hope



## Going for growth

**R**elative to other economies, world energy markets appear to be edging in the right direction for US petrochemical producers. Spurred by the enduring advantage of abundant US energy resources, in particular natural gas liquids, ACC, the Washington-based chemical industry trade body, believes “production and exports are poised for growth”.

Further backing this up are forecasts from the US Energy Information Administration (EIA), which finds that prices for US natural shale gas (named Henry Hub) are expected to average just under \$3 per million Btu in 2021 and 2022, up from \$2.03 in 2020. Henry Hub is the source of the ethane feedstock used by US chemical companies to produce ethylene and polyethylene. By contrast, most international competitors depend on crude-oil sourced naphtha feedstocks, and the EIA expects that the industry’s benchmark, Brent crude oil spot, to average \$53 per barrel in both 2021 and 2022, up from \$42 last year. Both natural gas and oil prices have recovered on global economic activity, and there are growing hopes that increasing vaccine availability will continue to drive growth.

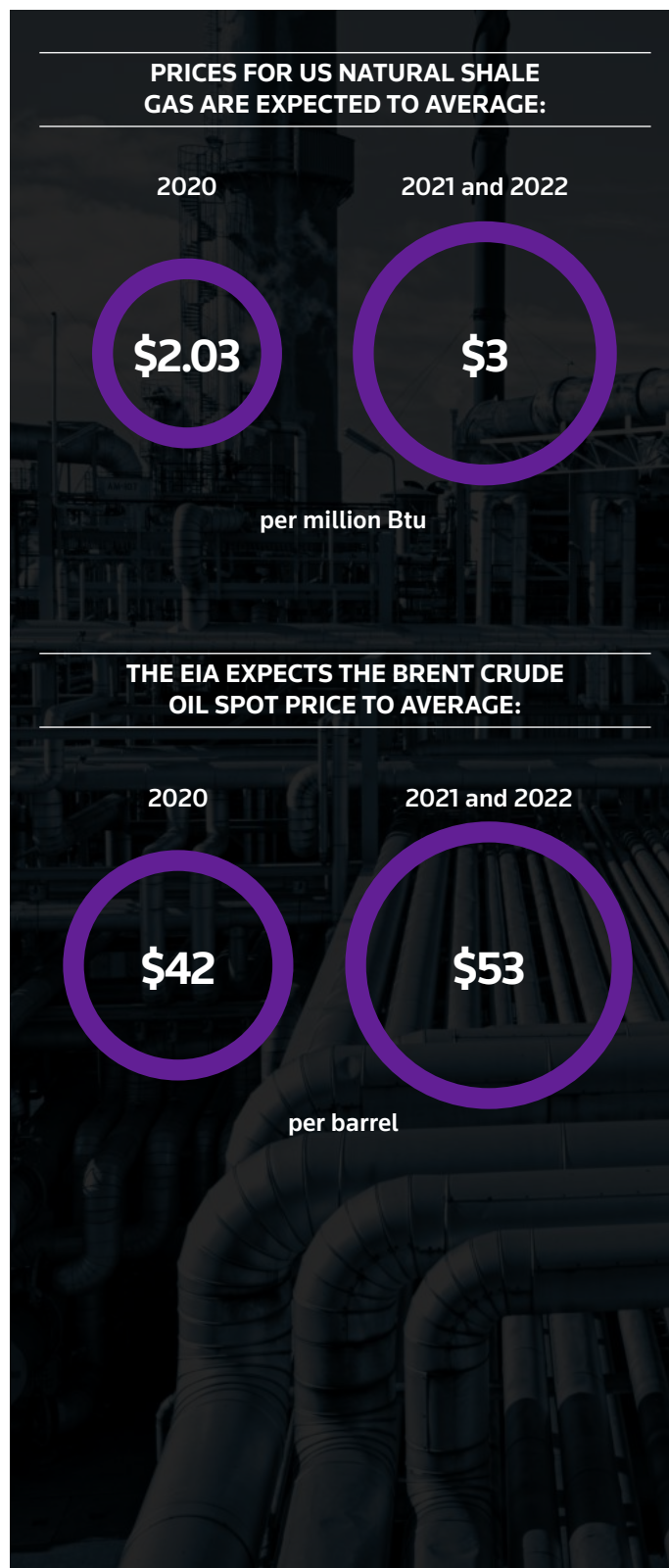


**It is not just feedstock that has made the US competitive, but also a highly skilled workforce and strong protection of intellectual property rights**

**ED BRZTYWA**

An abundance of shale gas has made the US the lowest-cost chemical producer outside the Middle East, attracting billions of dollars in investments and transforming it from an energy importer to an energy exporter. Storage of natural gas soared in 2019 as this heavy investment brought record shale production, adding to Covid-19 fall-out that depressed prices last year. However, the EIA estimates that annual US natural gas production will decline by two percent in 2021 but recover in 2022.

The ACC’s Ed Brzytwa is keen to stress that it is not just the feedstock factor that has made the US competitive but also an “educated and highly skilled workforce, and strong protection of intellectual property rights”.





Even when the oil, gas and gasoline prices crashed, there was still the chemical component driving development of diverse and innovative by-products...

**MARIA BURNS**  
 Director, Logistics and Transportation Policy Program,  
 University of Houston



## What diversity delivers

**W**

idely published Maria Burns, the director of the Logistics and Transportation Policy Program at the University of Houston, underscores that while the coronavirus delivered a sharp V-shaped market decline of 9%, three times the average range in ordinary times, “the paradox of US oil is that it is both a major global exporter and importer”. According to the EIA, the world’s biggest economy exports petrochemicals to 190 nations. “The US is also a major exporter of chemicals and, even during a global pandemic, this is an industry which is growing at 3.5% annually. And so despite the oil, gas and gasoline prices crash, there was still the chemical component driving development of diverse and innovative by-products like plastic, synthetic drugs, cosmetics, spare parts, fertilizers,

acids, industrial organic and agricultural chemicals, and so on,” she says.

It also helps that the US has established diverse trade agreements and its industry majors, the likes of ExxonMobil, Chevron and ConocoPhillips, have diversified investment into alternative energy sources.

By no means is 2020 a distant memory, but data from the ACC suggests that growth expectations are positive for all industries in 2021 except oil and gas. Motor vehicles, aerospace, appliances, iron and steel, petroleum refining, and plastic and rubber products are expected to show the largest gains.

Worth \$565 billion to the US economy, the chemistry industry is one of the largest and will continue to drive for growth.

## Rethinking the burden of tariffs

**F**or America's global petrochemical companies, which have complex, interwoven supply chains, the global pandemic has brought the negative impact of protectionist policies into even sharper focus. "We were already in a bad situation with tariffs but the pain and suffering caused by Covid-19 made the situation even worse," says Brzytwa, adding: "If we want to be resilient in terms of our supply chains we can't be imposing these types of artificial walls in the global factory."

For this reason, as the new Biden-Harris Administration knuckles down to work, the ACC is campaigning even harder for US industry. "I really want to underscore the point that if we want to make more and invest in America we don't need more tariffs, we need less tariffs, and we need to have a more holistic view of supply chains. Because, if we continue with this linear mindset, we will lose out to global competitors who will replace our market share," says Brzytwa.



### If we want to be resilient in terms of our supply chains we can't be imposing these types of artificial walls in the global factory

There are legal instruments to do this – for example, the US Manufacturing Competitiveness Act, at its core, recognizes the essential nature of US imports.

For instance, it establishes a process to allow companies to request temporary duty suspensions and reductions.

"We are a net exporting sector, but in order for our exports to be competitive we need affordable imports of inputs that are either of insufficient quality or quantity in the US, or not found at all," he explains.

The most recent blow is that the last Miscellaneous Tariff Bill (MTB), which allows individual manufacturers to petition for a reduction or suspension of tariffs (some as high as 25%) over a three-year period, expired on December 31st, 2020. As Brzytwa explains, the upshot of this is that "as of today, companies in the US are paying \$1.3 million a day in tariffs that they had avoided paying over last three years."

Among the most destructive quotas and tariffs are those

**\$1.3m**  
a day – tariffs paid  
by US companies that  
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years



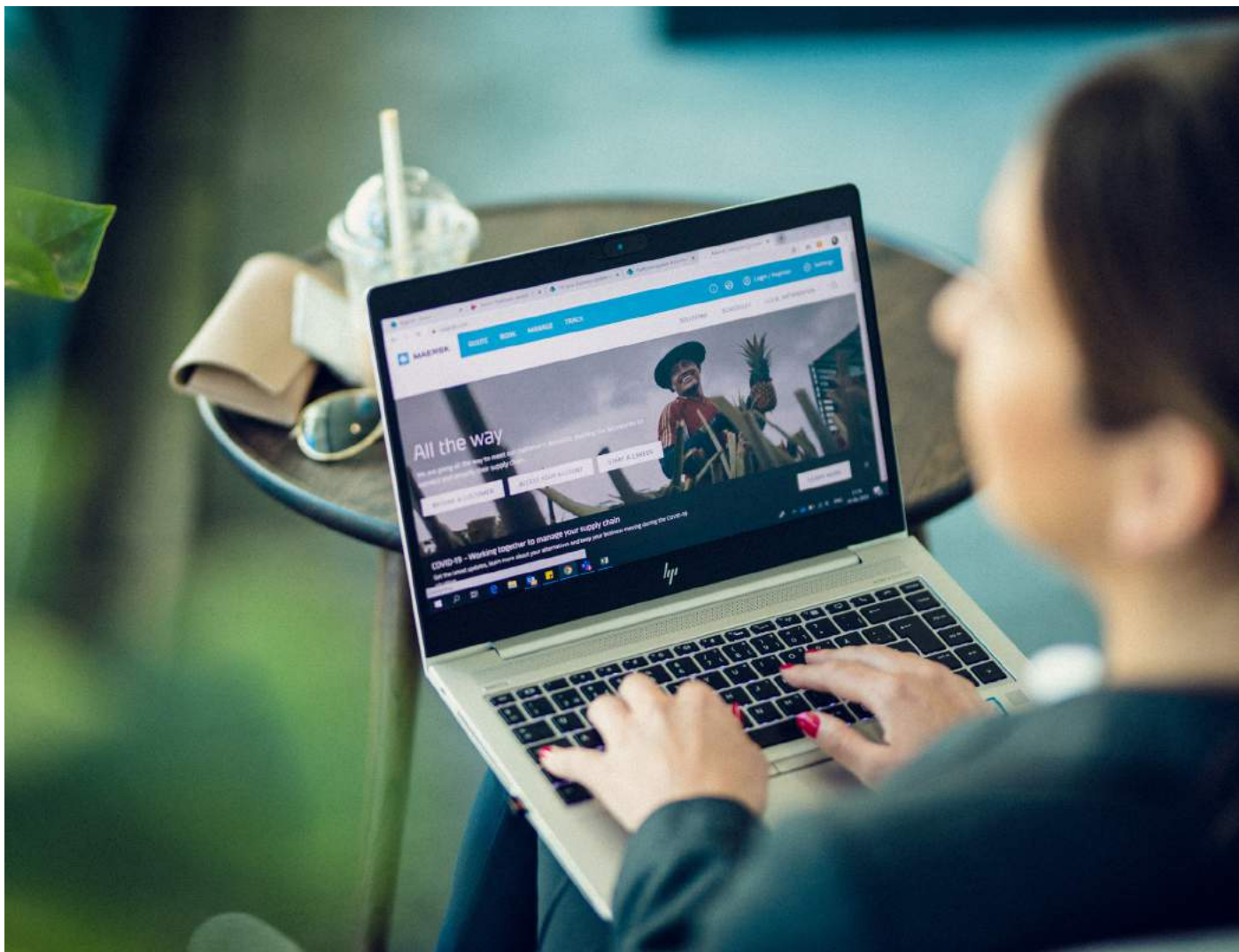
SHUTTERSTOCK/DVOEVNORE

levied on steel and aluminium imports. To build factories or ethylene crackers, 17,500 tons of steel is needed on average.

Before the steel tariffs, the US was able to import steel at a lower cost and within a timeframe that made sense for capitalizing on these investments. More recent numbers tell a different story. Between 2016 and 2022, the ACC was expecting chemical exports to rise by 44% to 2022. However, by 2019 those growth projections had fallen to 25%.

Not only are more job losses expected but these costs are being passed onto the consumer which, in turn, hits the downstream sector hard too.

As the US opens a new chapter, the ACC believes that the answer lies in global regulatory cooperation where industry has a seat at the table. "Our starting point is that we recognise the sovereignty of governments to regulate as they see fit. We acknowledge that we are a highly regulated industry, and we support that, but we want the environment to be as trade and investment friendly as possible," says Brzytwa, who cannot stress enough that: "Regulatory cooperation is one tool to help create more certainty so that companies can optimize their supply chains to be more resilient to other, potentially unpredictable variables in the trade landscape."



## Section 2

# 2021 & the New Normal Supply Chain

When markets decline abruptly, as they did in 2020, it is difficult for companies and global networks to adapt, and inevitably weaknesses are exposed. But to survive, adaptability is a necessity and will require accelerated digital transformation and integration







## Getting transport into the right lane

**E**ssential to any supply chain, transportation and logistics have faced their fair share of challenges over the past year – from adapting to radical shifts in consumer behavior driven by work-from-home orders, to regional and international border closures, container, aircraft and driver shortages, congested infrastructure and skyrocketing costs.

Professor Yossi Sheffi, Director of the MIT Center for Transportation and Logistics, is of the view that the pandemic is accelerating new normal supply chains, and especially the greater deployment of ecommerce, automation and robotics. He believes that this trend will continue and in order to compete with Amazon more companies will turn to technology platforms like Flexe – ‘the Airbnb for warehousing’. The advantage of such platforms, argues the MIT professor, especially for emerging ecommerce companies, is that they build flexibility, and thus reliance.

From its vantage point as an end-to-end logistics partner to the petrochemical sector, Danish global managed transportation company Maersk has a similar story. It soon learned that the more its customers were digitally integrated with their supply chain network partners, both internal and external, the better able they were to manage the disruptions of 2020. Says Faith Dennison, Maersk Head of Lead Logistics Product Development: “Companies with siloed segments and cumbersome manual methods were hard pressed to support their customers’ dynamically changing end-to-end needs over the past 12 months.”

Burns, of the University of Houston, argues that the

### Key takeaways for petrochemical beneficial cargo owners (BCOs):

- Digitization is a journey. Plan to make strides incrementally and not worry about hitting an immediate home run. Prioritize your pain points and execute accordingly.
- Advanced technology is readily available in the logistics services marketplace. Base cases for machine learning, predictive analytics, blockchain and so on have been proven. Dennison says the question now is: how can you work with your organization to start incorporating them into your supply chain in a tangible and meaningful way?
- Typically costs are involved in digitizing the supply chain. Pair cost analysis with a full ROI exercise to determine what value this can bring to your business.

larger the company the more likely it is to have invested in automation. However, she expects to see companies investing in innovative technologies as the new norm with stretched companies forming mergers and acquisitions in the coming year. But while small businesses may have borne the brunt of market fluctuations, Sheffi remains hopeful that the advance of technology will lead to a levelling up of the playing field.

## Tech Focus

# Why Maersk is banking on blockchain



**G**lobal trade is currently worth \$18-million a year and there is growing support to harness blockchain technology which, says IBM, “can do for transactions what the Internet did for information”. This is particularly relevant in the U.S. petrochemical industry where, according to the American Chemistry Council, 39 percent of all chemical exports and over half of its imports are between companies and their subsidiaries.

For this reason, Maersk is calling for all BCOs, the owners of products being shipped, to take it seriously. “By all accounts, blockchain is staged to permeate the industry within the next one to two years and early adopters will enjoy a competitive advantage when it does,” says Maersk’s Dennison.

In particular, the stage is set for ‘bill of lading’, a document issued by a carrier to acknowledge receipt of cargo for shipment, to be blockchain’s first significant application. Historically linked to sea carriage, a bill of lading can be used for any type of carriage of good, making it a critical document in international trade. It is also the oldest and has been exchanged in a relatively unchanged manner for decades.

Dennison believes a digitized, blockchain version of the bill of lading could dramatically increase the efficiency and speed

with which trade’s most important document is moved across supply chain participants. “Its issuance from the carrier, transfer from shipper to consignee and surrender can all be done on a blockchain user interface in a fraction of the time it takes for conventional bills of lading to be exchanged,” she says, adding: “Blockchain can enable secure, faster financial transactions in the bill of lading process.”

To get started Maersk recommends that companies:

- Isolate a segment of the supply chain as well as relevant partners
- Define clear goals
- Execute the blockchain pilot
- Capture proof of concept, and expand from there

As part of ongoing efforts, Maersk and IBM have collaborated to develop Tradelens, a blockchain platform that connects the ecosystem of supply chain partners including cargo owners, ocean and inland carriers, freight forwarders and logistics providers, ports and terminals, customs authorities and more. Among the major global shippers that have signed up to use the platform are MSC, CMA CGM, Hapag-Lloyd and ONE.

## Single vs multiple sources

**A**t XPO, another logistics company, Drew Wilkerson, President of North American Transportation, says the pandemic quickly exposed the importance of having a single source of visibility and tracking across various transportation modes and locations. Technology that can provide real-time responses is critical to help customers identify both time and cost-saving opportunities. XPO worked with an energy company to update the client's digital transportation platform with a pricing structure based on volume enabling the client to forecast quarterly demand.

"We adapted quickly and increased the amount of spot bids on lanes with reduced volume. This allowed our clients to adjust to rapidly changing supply and demand and ensure that they were paying market rates on all lanes," Wilkerson says.

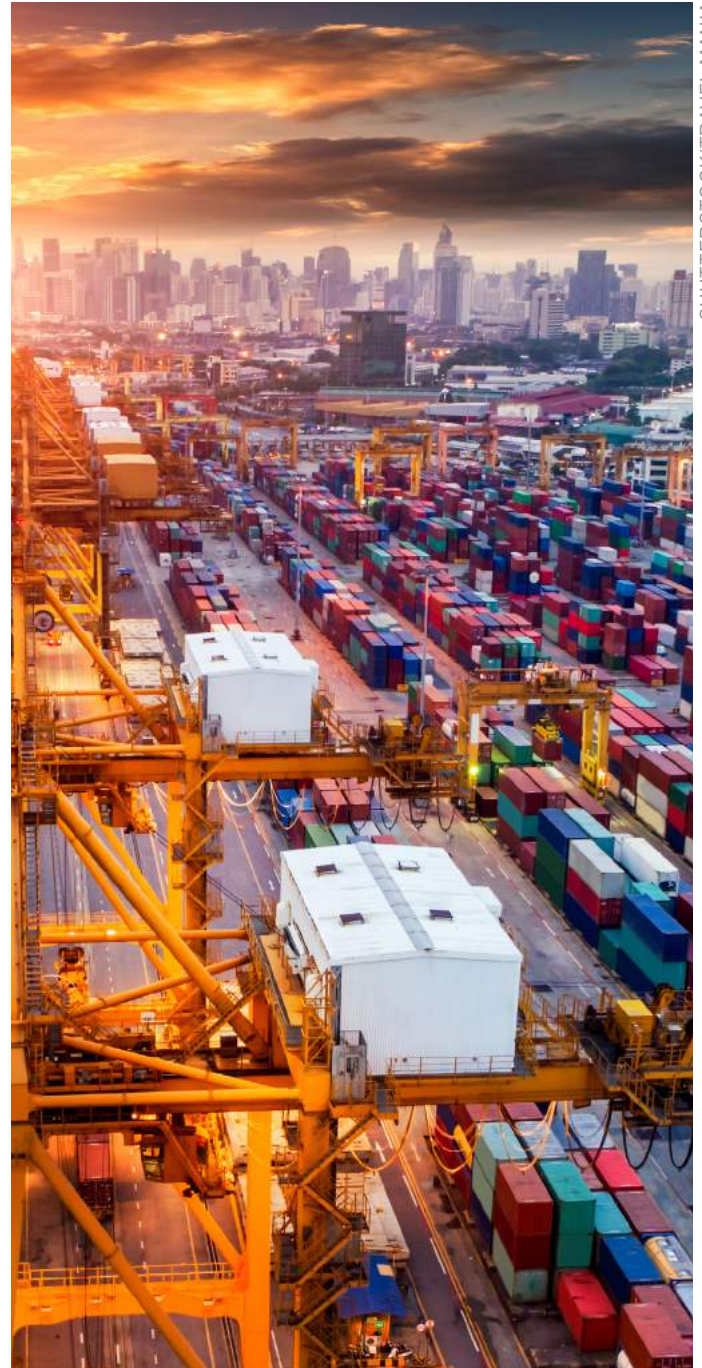


### Corporate leaders should most definitely be supporting increased investment in multi-chain corporate mapping

**PROFESSOR YOSSI SHEFFI**

Director, MIT Center for Transportation and Logistics

While a single source of visibility is vital to effective tracking, being beholden to a single supplier in a raging global storm can have devastating consequences. Sheffi argues that the pandemic has presented an opportunity to review its dealings with partners – to understand which can provide the capacity needed, which are looking stressed and which are financially robust. With so much uncertainty and repeated lockdowns, he strongly advocates that companies undertake supply-chain mapping in order to understand the value of their business risks. "Corporate leaders should most definitely be supporting increased investment in multi-chain corporate mapping," he stresses.



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## CASE STUDY

# Aramco & Maersk: Creating visibility from end-to-end



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**W**hen Aramco Chemicals Company, a subsidiary of Saudi Aramco, set out to find a new fourth-party logistics (4PL) provider, its leadership team had a clear remit. The team understood the growing complexity in the supply chain multiverse, and was in search of a proactive partner, with a global presence, that would meet the complex and growing needs of its business in evolving markets. With an eye on building new projects, forming joint ventures and boosting its business, Aramco's specific requirements included:

- Building a 4PL solution that was a proactive partnership rather than a reactive arrangement
- Finding a partner who would understand the heart and soul of the business before devising solutions. Having a global presence was key
- Creating visibility throughout the supply chain, especially across hubs and plants
- Improving inventory management and reducing logistics costs due to pressure in the chemical segment
- Ensuring lean processes, with measurable milestones and service levels
- Enhancing automation and eliminating manual handover points to reduce errors
- Rapidly responding to changing customer demands and markets including the replication of solutions in different locations when needed
- Delivering additional hub solutions in the Middle East and Asia for better and faster service to customers

With the objectives of reliability and scalability top of mind, the partnership has helped Aramco to implement a range of innovative solutions to address everything from booking management to warehousing and distribution, carrier and document management, freight audit and KPI dashboards.

A number of important outcomes emerged from the partnership. One involved improving and tying together the elements of an existing sourcing app. By working in a coordinated way with customers from across the sourcing community, and making incremental gains step by step, together Maersk and Aramco were able to co-create a solution that ensured optimization and management of multiple inventory locations.

Another was the development of bespoke supply chain intelligence dashboards to track specific visibility and analytics needs. By establishing a consistent and reliable set of KPIs, Aramco is now able to monitor the performance of different assets each month. In addition, market intelligence updates and best practices ensure that Aramco stays up to date with news and trends in the chemical and logistics markets.

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## Finding balance

**A**nother factor that has entered the new normal is the challenge of managing near-empty offices and factories, as employees are either reduced or sheltering at home. However, the solutions being brought in and invented to cope with such impacts of Covid-19 – such as IoT, real-time data analytics and telecommuting – will, according to experts, yield long-term corporate benefits.

However, Houston University academic Maria Burns warns that there is a balance to strike. “We mustn’t forget that humans are both producers and consumers of energy products. Therefore, governments and companies must work together and provide robust mechanisms that support the economy and help eliminate unemployment,” she says.

Logistic clusters could provide a solution, says Sheffi of MIT. For example, AllianceTexas Business Park, a private development near Fort Worth, has grown over time to attract more than 525 companies and over 60,000 jobs. With a

private-cargo-only airport and inland port transportation, including one of the nation’s largest intermodal yards, it has created sustainable, entry-level jobs.

As the push to make supply chains more efficient continues, Sheffi remains a little skeptical that some of the major changes forecast to evolve from the pandemic will ever materialize. Among these, the decline in just-in-time manufacturing – again in his view a huge source of resilience and flexibility – and inventory management.

He also does not buy into predictions that there will be a major reduction in sourcing from China. “Too much money has been spent developing whole supply chain ecosystems there, making it almost impossible to relocate,” he says.

For Sheffi, while the reconfiguration of supply chains continues, there are reassuring signs that even in the crisis many of the supply lines held despite the strains; the food industry was particularly successful.

In any event, Burns argues: “With sustained demand from the US, India, China, and other nations, there are clear indications that the global economy is recovering.”

CASE STUDY

# How Ford Motors pivoted to PPE with XPO

**A**s car production screeched to a standstill in the first half of 2020, the automotive industry was called on to address the growing shortages in ventilators, face shields and fabric masks. As the ACC has been keen to highlight, chemistry’s contribution to combatting Covid-19 by providing workers in healthcare and other essential industries as well as consumers with products and equipment has been immense. For example, chemistry represents:

- **75%** of the value of cleaning and disinfectant products
- **27%** of the value of medical equipment, including face masks, diagnostic equipment, disposable gowns, shoe booties and hoods
- **25%** of the value of material inputs used to make medical supplies such as test tubes, housings for test kits, goggles, surgical gloves and surgical instruments

Along with big name brands like General Motors and Fiat Chrysler, Ford Motor Company was one of those to pivot its business. But transporting a car is quite different to delivering a face shield. For this reason, Ford worked with XPO Logistics to manage the distribution of its new product lines. Drew Wilkerson, XPO President of North American Transportation, explains that this included rapidly establishing new lines of transportation, the redistribution of carriers and updates to technology to allow for parcel shipping. By supporting Ford with relevant transportation logistics know-how, the automotive giant was able to expedite thousands of shipments across the US to hospitals, fire departments, police stations, assisted living centers and more.



SHUTTERSTOCK/THESKAMAN306

**STRONGER TOGETHER:  
WHAT FORD & XPO DELIVERED**



**17 million**  
face shields



**20 million**  
face masks



**850,000**  
gowns, respirators  
and ventilators



**\$1.5 million**  
donated towards  
transportation



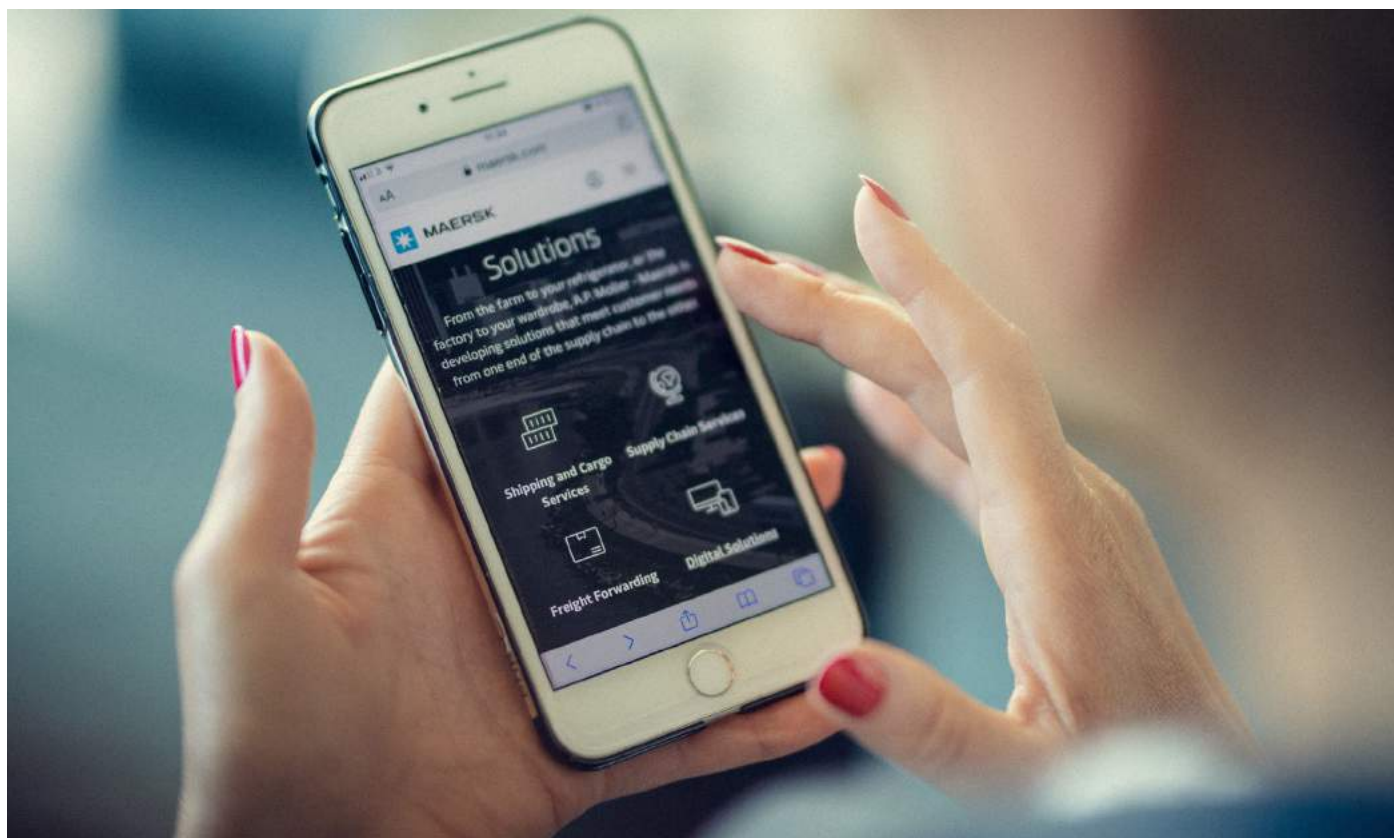
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## Section 3

# Rethinking Resilience

The word resilience may have been somewhat overused in 2020 but as the petrochemical industry faces profound shifts, for companies to adapt as they need to, it remains firmly on the agenda





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## Communication, transparency and openness

**R**esilience, which Houston University's Burns defines as "the ability of a system to recover during market fluctuations, changes, and disruptions" stems from "efficiency and contingency planning".

In the inherently dangerous chemical and oil and gas industries, contingency planning, risk management assessment and mitigation, and emergency response are deeply embedded practices. In the US, this is particularly true along the Gulf Coast where natural disasters, like hurricanes, are common. So while the unfortunate reality is that companies rarely get rewarded for risk management, Chad Burke, President and CEO of the Economic Alliance Houston Port Region, says of all the industries he has worked with "the chemical and oil and gas supply chains were most equipped to adapt quickly, shift and respond".

To understand how companies were responding to the crisis, Burke canvassed the views of numerous on-site managers of global petrochemical companies operating in the region. "Nobody could have foreseen the specific challenges of the pandemic but there were a few common themes to emerge in their responses," he says.

Consistently, what made companies most adaptable was their unanimous focus on constant, transparent and open conversation with suppliers, vendors, contractors and customers. "They didn't clam up, but immediately began communicating the challenges," Burke says. This allowed companies to remain aligned on project specifics including construction, pre-commissioning and commissioning targets.

As a company with visibility across the entire supply chain, Maersk's Dennison says: "The name of the game is streamlined communications, operational procedures and integrated visibility through systemic offerings supported by best-in-class boots on the ground execution."

Continuous learning has never been more important, she adds, and exporters and importers will do well to adopt a questioning approach. The former must understand everything, from which tools and methods are being used to ensure carriers and origin suppliers receive booking details to whether export compliance and other documentation is being handled efficiently. Meanwhile, importers must know how shipments are being tracked and traced, and whether customs clearance documentation is adequately streamlined. Probably the most important question to ask, says Dennison, is: what manual processes exist in this workflow?



# 7 Steps to resilience & adaptability

## 1 OPTIMIZE AND ADD VALUE TO PROCESSES

Companies must eliminate global supply chain vulnerabilities, restructure global logistics networks and make relevant substitutes in the event of disruption. One way to iron out disruptions in production or supply is to carry more inventory closer to the customer. Crucially, however, Covid-19 has shown that while keeping costs down is important this should not be at the expense of adding value.

## 2 ENSURE FINANCIAL & OPERATIONAL INDEPENDENCE

Organizations must work to eliminate debt, diversify their investments and, where necessary, liquidate underused assets or obsolete machinery. In other words, get rid of what is unnecessary, dated, unused or unprofitable.

## 3 BUILD A CULTURE OF OPENNESS AND TRANSPARENCY

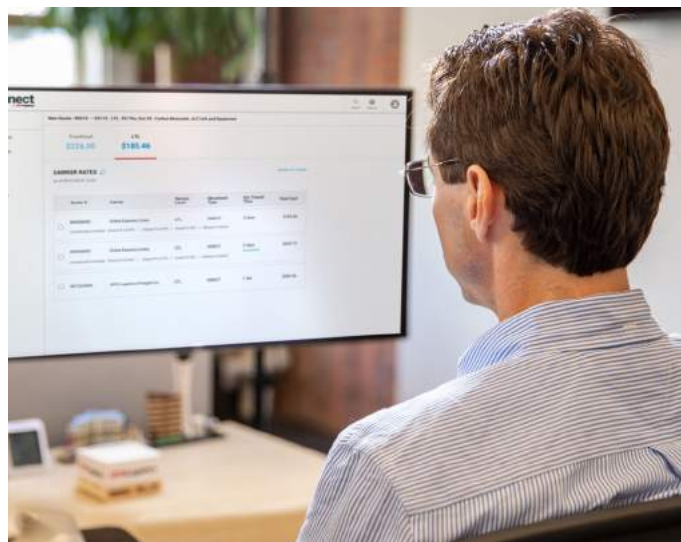
Across the board, open and transparent communication helped ensure all stakeholders remained aligned on project specifics including construction, pre-commissioning and commissioning targets. Working creatively with trusted and flexible partners, and deepening those relationships so that lessons flow in both directions, are always the most beneficial relationships.

## 4 BROADEN AND REVIEW RELATIONSHIPS

In many cases, lockdown has impacted the ability to access segments of supply chains in different geographies both domestically and internationally. Companies have recognized the importance of moving from single to multiple sources of supply relationships, and investing in reliable physical infrastructure, even if this means higher costs. Always have a Plan A, B and C. Regular reviews, at least annually, and desktop drill scenarios should be carried out.

## 5 CREATE END-TO-END VISIBILITY AND FLEXIBILITY

Being prepared for the unknown with scenario planning, data analytics and market intelligence will help



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companies adapt to any situation. The right decisions can only be made if you have access to the right level of information, and are able to predict, plan, sense and act with agility.

## 6 KNOW THE REGULATORY ENVIRONMENT

Getting to grips with new and existing government policies can help to determine the rules and stay ahead of business and employment opportunities, including incentives and perks for people to access training and benefits or find new career paths. As the push towards decarbonization continues, companies will need to take a mature approach to focus on environmental, social and governance policies. Rallying the powers that be for more business-friendly policies and temporary, or better still, permanent suspensions of tariffs are arguably the most important step towards resilience.

## 7 REDEFINE AND MODERNIZE BUSINESS

Digital transformation and integration, along with the ramp-up of investment in IoT, automation and artificial intelligence, will yield corporate benefits, but must be done with human interests in mind. Avoiding a siloed and fragmented approach is a must.

## CASE STUDY

## How XPO Logistics helped a large oil and gas firm save \$5 million

**E**ven before Covid-19, oil and gas energy technology companies faced supply chain challenges. As the pandemic amplified these, one of these companies sought out XPO logistics to gain better technology, analytics, visibility and savings. By implementing XPO Connect, a technology with built-in machine learning, it was better able to improve its supply chain capabilities.

Among the benefits of this investment were to:

- Create new supply chain savings to help address the unexpected financial challenges of Covid
- Leverage a suite of petrochemical tools, best practices and deliver creative solutions that led to significant savings as volumes declined
- Apply multiple solutions including the removal of some Hub & Spoke models
- Reconfigure Less-Than-Load (LTL) solutions by removing the cross dock and installing an LTL flatbed solution instead
- Provide real-time responses for customers via XPO Connect, a digital transportation platform that helps customers identify both time and cost-saving opportunities. It allows shippers and carriers to connect on full truckload or less-than-truckload loads, view rates, select their desired carrier and book
- Harness data analytics to keep up with a constantly changing environment, vital during the Covid-19 crisis when companies needed daily alerts from countries and states to assess the impact on freight

### The outcome:

A whopping \$5 million in cost savings, while maintaining the same transit days for delivery on 99% of lanes.

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## Section 4

# Burning Issues: Sustainability, Safety and Shortages

As companies grapple with short-term challenges, innovation and the shift to a more circular economy, keeping workers safe and managing talent will remain long-term objectives





## All hands on deck

**A**s businesses struggle for survival in 2021, there is the risk that sustainability may find its way onto the backburner. That is the last thing that should be happening, says the ACC's Ed Brzytwa who believes the industry has "a duty to innovate and a responsibility to ensure that products are produced and used in a way that protects human health and the environment".

From clean water and sanitation to affordable and clean energy, infrastructure, sustainable cities and communities, the petrochemical industry has a vital role to play in delivering the UN Sustainable Development Goals in all corners of the world, and safe chemicals are required to accomplish all of these objectives.

Growing global pressure to reduce climate change is spurring on innovation. According to the ACC, for every tonne of carbon dioxide emitted in manufacturing the products of chemistry, two tonnes of CO<sub>2</sub> emissions are saved. Examples of products making a difference include building insulation, which can save 40 times the energy used to create it, while plastic house wrap with its weather-resistant barrier, as much as 360 times.

"One of the primary ways we can prevent more emissions in the environment is through greater energy efficiency, and the products of chemistry enable that," says Brzytwa, who says the ACC and its members proactively support the pursuit of

a more circular economy. Aside from design innovation that leads to longer product lifespans, ACC members are investing billions of dollars in advanced reuse, recycling and recovery technologies. "The goal is for the chemicals used to make products like plastics to remain in the stream of commerce and be used 'again, and again, and again!'"

Acknowledging that we live in a complex world, Brzytwa says more can be done to innovate and create the right enabling environment. "We need all hands on deck," he says.



## The petrochemical industry has a vital role to play in delivering the UN Sustainable Development Goals in all corners of the world

In the logistics business, XPO Logistics' Wilkerson says: "There's a great deal the industry can do to help supply chains evolve in an environmentally sound direction." For Maersk's Dennison, sustainability can and should be involved in every supplier agreement. "Petrochem BCOs should demand services such as CO<sub>2</sub> reporting and emissions reductions as a matter of course for their supply chains," she says.

## Putting safety first

If sustainability is on the US global agenda, safety is even closer to home. "Safety is the foundation of the department's mission..." So said US Transportation Secretary nominee Pete Buttigieg in his testimony to the US Senate Committee on Commerce, Science & Transportation. He was voicing a sentiment heartily shared by the trucking industry and its suppliers in the insurance and automotive industries, which are witnessing very different experiences – the former struggling to make profits despite soaring prices, thus driving safety in all aspects of automotive design.

For this reason, some companies are prioritizing investment in collision avoidance systems. Soaring insurance costs are hitting double digits, some rising by as much as 20-30%, according to brokers, as insurers have been confronted with 'nuclear accident pay-outs' of \$10 million or far more and escalating.

Combined with electronification, preparation for autonomous vehicles and sustainability legislation, this is creating a market that is highly receptive to the new materials and technologies being designed by the chemical and automotive industries. BASF, for example, has for many years produced lightweight plastics that can be used in the front of vehicles to absorb energy from an impact, creating a 'crumple zone' which can collapse like an accordion. At the same time, glazing can help prevent windows and windshields from shattering due to impact.

Safety is an important priority, but so too is streamlining processes to reduce the time that drivers are held in loading bays so that service is not impacted. Developments on this front are sensors, circuit boards and other electronic devices, which are used in a growing number of situations, from collision avoidance to monitoring throughout the whole process of loading, to help the efficient flow of products and avoid bottlenecks.

But not everybody thinks technology is the answer. Danny Schnautz, Manager, Clarke Freight Lines, has this view: "We don't need growing investment in collision safety systems. We need two things: lawsuit reform for trucks, and traffic enforcement for trucks and cars. The commercial vehicle inspections are a revenue source for cities, and do almost zero to help with crashes."

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SHUTTERSTOCK/METAMORWORKS

## Finding solutions to shortages

Is this the decade when the shortage of long-haul truck drivers, a long-standing US industry problem, can be overcome? The dearth of drivers is put at 50,000 to 80,000 and is expected to reach 105,000 by 2023, according to the American Trucking Associations. Given that getting on for three-quarters of freight tonnage moved in the US is carried by trucks, this continues to create serious pressure on carrier costs and supply chains. The American Transportation Research Institute (ATRI) says the shortage has been the No. 1 industry issue for the last four years.

The causes of driver and trucking shortages are well known – from wage levels to insurance costs, health and drug issues, job and lifestyle stresses and parking problems. Most recently, the Covid-19 pandemic has made drivers reluctant to make long trips away from home.

But Schnautz argues that, in fact, there is no driver shortage: "It's like saying I am having trouble finding a really good \$3 steak. There is no shortage of really good steaks, but you can't get them for \$3."

His view is that stagnant pay and churn are the two big issues. "They work 60+ hours per week, usually much more, often away from home. It's dangerous and filled with fines and frustration, for maybe \$45k-\$60k per year. Come on, man! There are over 100,000 commercial drivers licenses (CDLs) issued each year, but the job, the stress, the pay are so bad that most new entrants do not stay."

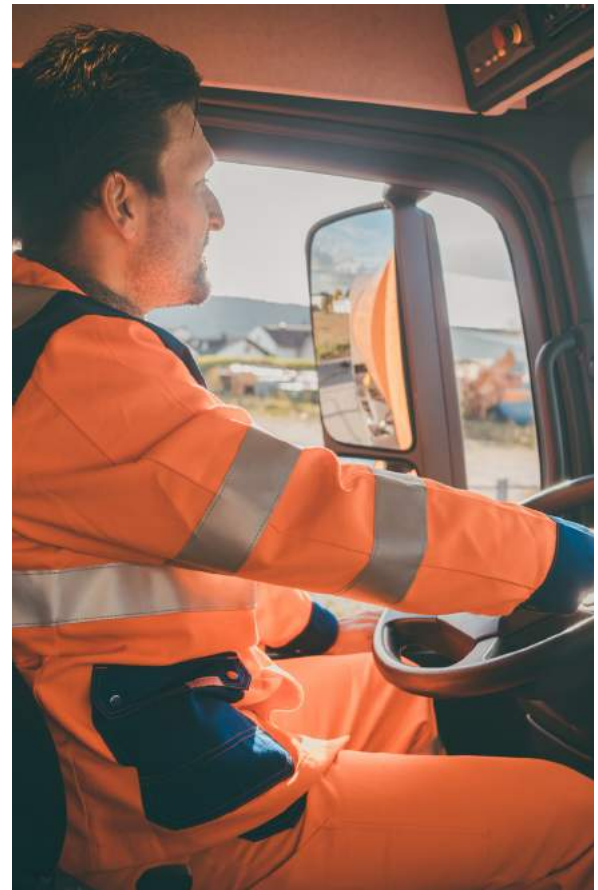
The crisis is being increasingly researched in a quest for solutions, but until autonomous trucks eventually become commonplace, the industry is left trying to manage the situation.

One solution, from ATRI analysis of its annual industry survey, is to lower the driving age limit with apprenticeship programs to attract, train and retain safe 18 to 20-year-old interstate drivers to the industry.

Another ATRI strategy suggestion is to increase the numbers of women and minorities drivers. As it stands, women account for 6.7% of the truck driver population and minorities 41.5%.

Management solutions to combat driver shortages being explored by the industry itself include using computer modelling to determine if supply chains can be reconfigured. For example, switching from tractor-trailers to trucks so as to broaden the pool of drivers to include those with a Class B commercial driver's license.

A notable trend, according to one logistic consultant, is to use storage facilities closer to manufacturing units, combating driver shortages by reducing the number of



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**50,000 to 80,000**  
the shortage of truck drivers  
expected in 2021

**105,000**  
expected shortages by 2023

*American Trucking Associations*

miles needing to be driven. Yet again, there can be negative repercussions in the form of higher inventory holding costs and an inability to synchronize with just-in-time-supply strategies. Freight pooling is another solution being adopted.



SHUTTERSTOCK/YUTTANA CONTRIBUTOR STUDIO

## Conclusion

Companies from across the petrochemical industry, in varying degrees, continue to face challenges from the Covid-19 pandemic, and it is not over yet. But the outlook is not as bleak as some may have feared. In 2021, according to the ACC’s 2020 year-end outlook, the market indicators point to a rebound with growth at 3.9%. After falling 9% last year to \$124 billion, exports are forecast to recover to \$134.5 billion in 2021. Industrial production is expected to rise 3.7% in 2021 and by 3.5% in 2022.

With growth anticipated for nearly all industries, and the largest gains expected in automotive, aerospace, appliances, iron and steel, petroleum refining, plastic and rubber products, there is every reason to innovate. Investing in emerging technologies and reconfiguring and streamlining global supply chains will be top of mind as the pace of change accelerates. Companies that take a long-term view and invest in research and development, innovative technologies and talent, and continuously learn, have the most to gain.